Hospital Acquired Infections

2011-2012

Report

Disparities National Coordinating Center

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Healthcare Associated Infections Disparities Data

National Report

Disparities National Coordinating Center

January 1, 2011 to December 31, 2012

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Introductory Material

Purpose

Hospital-Associated Infections (HAIs) are a key CMS outcome evaluation measure selected for the 10th SOW core contract. This report presents data on three specific HAIs:

- Central line-associated bloodstream infections (CLABSIs)
- Catheter-associated urinary tract infections (CAUTIs)
- *Clostridium difficile* infections (CDIs)

To help QIOs view HAIs through the lens of health equity, these data are further broken down by several demographic characteristics including sex, race/ethnicity, age, dual eligibility, urban/rural status, and the local poverty level in the beneficiary's home zip code.

Changes from the 2011 HAI Report

We have made a number of changes to the 2012 HAI report. The most important of these is that we are no longer reporting HAI rates. Instead, we report rates relative to a reference group (generally the most privileged subgroup for each factor analysis; for example, the reference group for race/ethnicity is Whites). This decision was made in consultation with national authorities on HAIs.

We made the switch to relative rates for two reasons. First, we know that the method for identifying HAI rate employed by this report probably underreports HAIs, but that disparities between rates are expected to be unbiased. Second, we wanted to minimize confusion about this report stemming from the fact that we do not use NHSN data and that the rates we previously reported are not directly comparable to rates that QIOs are used to seeing.

Other changes:

- We restrict analysis to short-term and critical access hospitals. Previously we included all hospitals.
- We now include both crude relative rates as well as adjusted rates. Adjusted relative rates control for the fact that several of the factors we report on are confounded by other factors. For example, we know that White Medicare beneficiaries are on average older and wealthier than non-Whites; therefore, we know that any differences we see between Whites and non-Whites are also influenced by the effects of age and poverty in addition to the effect of race. Adjustment takes this into account and produces an "all things being equal" relative rate. A more detailed discussion follows in the Description of Tables section.
- We now include p values for all relative rates.
- Factor levels of "other" or "unknown" have been dropped.
- We are now reporting demographic data strictly from Medicare Enrollment files. Previously we had relied on claims data.

Data Source and Definitions

The data source for all clinical data in this report is Medicare Part A Fee For Service (FFS) Claims for CYs 2011 and 2012. Demographic data, including dual eligible status are taken from Medicare Enrollment tables. Beneficiaries are counted as dual eligible if they were covered by any state buy-in during 2011.

Data on local poverty are taken from the US Census 2007 - 2011 American Community Survey (ACS). For the purposes of this analysis, local poverty is defined as % of residents living below the poverty line in beneficiaries' zip codes. We group these data into quartiles. Quartile 1 (Q1, 20% or more residents living in poverty) indicates high local poverty while Q4 (0 – 7.9%) indicates low poverty.

Data on urban/rural status are taken from the 2010 Census. The Census classifies urban areas into three groups: Urbanized Areas (50,000 or more people), Urban Clusters (2,500 to 50,000 people), and non-Urban Areas ("Rural," all other areas.) See the Census web page on urban and rural classification for more information: http://www.census.gov/geo/reference/urban-rural.html.

The report's population is all Medicare FFS hospital discharges from short-term or critical access hospitals, 2011 - 2012. Admissions with an HAI are identified and classified using ICD-9 diagnosis codes. Admissions in which an HAI is identified as the primary diagnosis or as being present on admission are not counted. A full list of HAI diagnosis codes is included as an appendix to the report.

Description of the Tables and Methods

Table 1 shows crude rate ratios for CLABSIs in 2012 and 2011. A description of the fields follows:

- US # of CLABSI -- the actual count of CLABSIs in the US as identified by ICD-9 codes.
- US RR -- the relative rate (RR) for this level of the factor. Read, for example, as "relative rate for Blacks as compared to Whites."
    - A RR of 1 indicates that the two rates are equal
    - RR of 2 indicates a rate twice as high as in the reference group
    - RR of 0.5 indicates a rate half that of the reference group.

  RR will be missing for the reference level, indicated by a period instead of a numerical value.
    - Reference levels are: 65- 69 year of age, not dual eligible, male gender, 0 - 7.9% local poverty, White race/ethnicity, living in an urbanized area.
- US p value -- statistical significance of the relative rate value. Generally, a p value of 0.05 or less is considered statistically significant. However, given the very large number of statistical comparisons being made in this report, it may be prudent to use a lower cutoff ($p < 0.001$) for statistical significance.

  Note also that we only show one significant digit after the decimal point for RRs. Therefore, you may see cases where a RR is 1.0 but still statistically significant. This is due to rounding.

Table 2 shows adjusted rate ratios for CLABSIs in 2012 and 2011. Adjustment controls for confounding between the factors we report on (for example, White beneficiaries tend to be older and wealthier than non-Whites). Adjusted RR and p values are otherwise read in the same way as crude rates.

To create adjusted rate ratios, we use a regression model (Poisson distribution using a log link) that simultaneously controls for all the factors included in this report.

Tables 3 and 4 show crude and adjusted rate ratios for CAUTI, while tables 5 and 6 show crude and adjusted rates for CDI. They are read the same way as tables 1 and 2, respectively.

Table 7 shows crude CLABSI, CAUTI, and CDI rates by state. Note that these are rates and not relative rates.

Table 8 focuses on one of the most striking and persistent HAI disparities in our data, the elevated CLABSI rate in Black versus White beneficiaries. Relative rates and p values are shown at the state level. Note that for accuracy purposes, data are censored for states with fewer than 40,000 patient days for Black beneficiaries.

National Findings

National-level HAI trends are summarized below.

- Age
    - CLABSI rate decreases as age increases. This is true for both crude and adjusted rates.
    - CAUTI and CDI rates increase as age increases. This is less extreme for CDI than it is for CAUTI.
- Dual Eligible
    - Dual eligible beneficiaries have a much higher crude rate than non-dual eligible beneficiaries for CLABSI (RR 1.5 in 2012). The adjusted rate is still elevated but is less extreme (RR 1.1).
    - Dual eligible beneficiaries have a lower crude CAUTI rate than non-dual eligibles. However, after adjustment, the rates are the same (adjusted RR 1.0 for 2012).
    - The opposite pattern is true for CDI. Dual eligibles do not have an elevated crude rate but do have a somewhat elevated adjusted rate.
- Gender
    - NB: we have found that at the state level, gender often does not behave the same way as it does at the national level.
    - Women have a decreased rate of CLABSI and an increased risk of CAUTI compared to men. There is no difference in genders in terms of CDI rate.
- Local Poverty
    - High local poverty is associated with an increased crude CLABSI rate, e.g., in 2012 the crude CLABSI RR for 20%+ local poverty was 1.25. However, after adjustment, there appears to be no relationship between local poverty and CLABSI.
    - High local poverty appears to be associated with a decreased crude CAUTI rate. This trend is still present in the adjusted rates but is less extreme.
    - High local poverty also appears to be associated with decreased crude and adjusted CDI rates.
- Race/Ethnicity
    - Crude and adjusted CLABSI rates are higher for non-Whites than they are for Whites. Blacks have the highest relative rate (crude RR 2.0, adjusted RR 1.6 in 2012).
    - Crude CAUTI rates are lower for non-Whites than for Whites. In general, adjusted rates are also lower, but for Blacks they are about the same.
    - Crude CDI rates are elevated for Asians, lowered for Hispanics, and about the same for Blacks compared to Whites. After adjustment, rates are still higher for Asians and lower for Hispanics, but become elevated for Blacks relative to Whites.
- Urban/Rural
    - Living in a rural area or an urban cluster is associated with a decreased rate of CLABSI and CDI.
    - CAUTI rates are about the same regardless of urban/rural status.

Further Analysis and Technical Assistance

Please contact the DNCC if have any questions about using or interpreting the report; if you would like to request access to more granular data than the summary presented here; or if you have suggestions for future data releases.

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Table 1: Crude CLABSI Rates

		Year							
		2012				2011			
Factor	Level	Patient Days	US # CLABSI	US RR	US p value	Patient Days	US # CLABSI	US RR	US p value
Age	(1) <65 Yrs	17075698	3374	**1.2**	<.0001	17228062	4230	**1.1**	<.0001
	(2) 65 - 69 (reference)	8951336	1424	**.**	.	8889985	1934	**.**	.
	(3) 70 - 74	9036801	1295	**0.9**	0.0065	9186490	1692	**0.8**	<.0001
	(4) 75 - 79	9087749	1073	**0.7**	<.0001	9465321	1566	**0.8**	<.0001
	(5) 80 - 84	9053957	893	**0.6**	<.0001	9558321	1118	**0.5**	<.0001
	(6) 85+	11523754	645	**0.4**	<.0001	11884356	947	**0.4**	<.0001
Dual Eligible	No (reference)	42293324	4949	**.**	.	43185799	6662	**.**	.
	Yes	19036382	3355	**1.5**	<.0001	19539007	4292	**1.4**	<.0001
Gender	Female	33623012	4250	**0.9**	<.0001	34547949	5681	**0.9**	<.0001
	Male (reference)	27706694	4054	**.**	.	28176857	5273	**.**	.
Local Poverty	(Q1) 20%+	15244484	2348	**1.3**	<.0001	15798873	3069	**1.2**	<.0001
	(Q2) 13.4 - 19.9%	15212316	2049	**1.1**	0.0029	15538333	2673	**1.0**	0.2275
	(Q3) 8.0 - 13.3%	15036776	1968	**1.1**	0.0399	15384006	2548	**1.0**	0.8612
	(Q4) 0.0 - 7.9% (ref)	15798153	1936	**.**	.	15964519	2657	**.**	.
Race/Ethnicity	American Indian/Alaska	395112	59	**1.3**	0.0577	398652	70	**1.2**	0.2179
	Asian or Pacific Island	803766	116	**1.2**	0.0223	804387	161	**1.3**	0.0005
	Black	8657704	2018	**2.0**	<.0001	8822594	2613	**2.0**	<.0001
	Hispanic or Latino	1463279	228	**1.3**	<.0001	1494875	295	**1.3**	<.0001
	Other or Unknown Race/E	4262129	558	**1.1**	0.0084	4310116	718	**1.1**	0.0146
	White (reference)	49147305	5725	**.**	.	50381911	7630	**.**	.
Urban/Rural	Non-urban Area	6672059	698	**0.7**	<.0001	6841305	1034	**0.8**	<.0001
	Urban Cluster	10938714	1186	**0.7**	<.0001	11232860	1580	**0.8**	<.0001
	Urbanized Area (ref)	43718694	6420	**.**	.	44650538	8340	**.**	.

Table 2: Adjusted CLABSI Rates

		Year			
		2012		2011	
Factor	Level	US RR	US p value	US RR	US p value
Age	(1) <65 Yrs	**1.2**	<.0001	**1.1**	<.0001
	(2) 65 - 69 (reference)	**.**	.	**.**	.
	(3) 70 - 74	**0.9**	0.0246	**0.9**	<.0001
	(4) 75 - 79	**0.8**	<.0001	**0.8**	<.0001
	(5) 80 - 84	**0.6**	<.0001	**0.6**	<.0001
	(6) 85+	**0.4**	<.0001	**0.4**	<.0001
Dual Eligible	No (reference)	**.**	.	**.**	.
	Yes	**1.1**	<.0001	**1.1**	<.0001
Gender	Female	**0.9**	<.0001	**0.9**	0.0004
	Male (reference)	**.**	.	**.**	.
Local Poverty	(Q1) 20%+	**1.0**	0.3303	**0.9**	0.0004
	(Q2) 13.4 - 19.9%	**1.0**	0.9475	**0.9**	0.0377
	(Q3) 8.0 - 13.3%	**1.0**	0.7612	**0.9**	0.0327
	(Q4) 0.0 - 7.9% (ref)	**.**	.	**.**	.
Race/Ethnicity	American Indian/Alaska	**1.2**	0.2476	**1.1**	0.6413
	Asian or Pacific Island	**1.1**	0.1758	**1.2**	0.0060
	Black	**1.6**	<.0001	**1.6**	<.0001
	Hispanic or Latino	**1.1**	0.1320	**1.1**	0.0232
	Other or Unknown Race/E	**1.3**	0.0018	**1.2**	0.0038
	White (reference)	**.**	.	**.**	.
Urban/Rural	Non-urban Area	**0.7**	<.0001	**0.8**	<.0001
	Urban Cluster	**0.8**	<.0001	**0.8**	<.0001
	Urbanized Area (ref)	**.**	.	**.**	.

Table 3: Crude CAUTI Rates

		Year							
		2012				2011			
Factor	Level	Patient Days	US # CAUTI	US RR	US p value	Patient Days	US # CAUTI	US RR	US p value
Age	(1) <65 Yrs	17075698	997	**0.9**	0.0854	17228062	1046	**0.9**	0.0076
	(2) 65 - 69 (reference)	8951336	572	**.**	.	8889985	618	**.**	.
	(3) 70 - 74	9036801	681	**1.2**	0.0036	9186490	700	**1.1**	0.0963
	(4) 75 - 79	9087749	777	**1.3**	<.0001	9465321	819	**1.2**	<.0001
	(5) 80 - 84	9053957	791	**1.4**	<.0001	9558321	963	**1.4**	<.0001
	(6) 85+	11523754	1124	**1.5**	<.0001	11884356	1241	**1.5**	<.0001
Dual Eligible	No (reference)	42293324	3393	**.**	.	43185799	3700	**.**	.
	Yes	19036382	1251	**0.8**	<.0001	19539007	1388	**0.8**	<.0001
Gender	Female	33623012	2787	**1.2**	<.0001	34547949	2980	**1.2**	<.0001
	Male (reference)	27706694	1857	**.**	.	28176857	2108	**.**	.
Local Poverty	(Q1) 20%+	15244484	975	**0.8**	<.0001	15798873	1088	**0.7**	<.0001
	(Q2) 13.4 - 19.9%	15212316	1165	**0.9**	0.0114	15538333	1221	**0.8**	<.0001
	(Q3) 8.0 - 13.3%	15036776	1164	**0.9**	0.0237	15384006	1296	**0.9**	0.0113
	(Q4) 0.0 - 7.9% (ref)	15798153	1339	**.**	.	15964519	1481	**.**	.
Race/Ethnicity	American Indian/Alaska	395112	27	**0.9**	0.4580	398652	37	**1.1**	0.5696
	Asian or Pacific Island	803766	58	**0.9**	0.5018	804387	50	**0.7**	0.0309
	Black	8657704	556	**0.8**	<.0001	8822594	636	**0.9**	0.0002
	Hispanic or Latino	1463279	68	**0.6**	<.0001	1494875	55	**0.4**	<.0001
	Other or Unknown Race/E	4262129	357	**1.1**	0.2762	4310116	352	**1.0**	0.5396
	White (reference)	49147305	3876	**.**	.	50381911	4257	**.**	.
Urban/Rural	Non-urban Area	6672059	521	**1.0**	0.4109	6841305	555	**1.0**	0.7969
	Urban Cluster	10938714	838	**1.0**	0.6113	11232860	953	**1.1**	0.1210
	Urbanized Area (ref)	43718694	3284	**.**	.	44650538	3580	**.**	.

Table 4: Adjusted CAUTI Rates

		Year			
		2012		2011	
Factor	Level	US RR	US p value	US RR	US p value
Age	(1) <65 Yrs	**0.8**	0.0020	**0.8**	<.0001
	(2) 65 - 69 (reference)	**.**	.	**.**	.
	(3) 70 - 74	**1.2**	0.0048	**1.1**	0.1130
	(4) 75 - 79	**1.3**	<.0001	**1.2**	<.0001
	(5) 80 - 84	**1.3**	<.0001	**1.4**	<.0001
	(6) 85+	**1.5**	<.0001	**1.5**	<.0001
Dual Eligible	No (reference)	**.**	.	**.**	.
	Yes	**1.0**	0.3446	**1.0**	0.9393
Gender	Female	**1.2**	<.0001	**1.1**	0.0007
	Male (reference)	**.**	.	**.**	.
Local Poverty	(Q1) 20%+	**0.8**	<.0001	**0.8**	<.0001
	(Q2) 13.4 - 19.9%	**0.9**	0.1664	**0.9**	0.0007
	(Q3) 8.0 - 13.3%	**0.9**	0.1062	**0.9**	0.0438
	(Q4) 0.0 - 7.9% (ref)	**.**	.	**.**	.
Race/Ethnicity	American Indian/Alaska	**1.0**	0.9972	**1.3**	0.1464
	Asian or Pacific Island	**0.9**	0.5790	**0.7**	0.0317
	Black	**1.0**	0.3938	**1.0**	0.7034
	Hispanic or Latino	**0.7**	0.0014	**0.5**	<.0001
	Other or Unknown Race/E	**1.0**	0.8642	**0.9**	0.2637
	White (reference)	**.**	.	**.**	.
Urban/Rural	Non-urban Area	**1.1**	0.2060	**1.0**	0.5156
	Urban Cluster	**1.0**	0.2433	**1.1**	0.0103
	Urbanized Area (ref)	**.**	.	**.**	.

Table 5: Crude CDI Rates

		Year							
		2012				2011			
Factor	Level	Patient Days	US # CDI	US RR	US p value	Patient Days	US # CDI	US RR	US p value
Age	(1) <65 Yrs	17075698	10218	**0.9**	0.0004	17228062	10143	**0.9**	<.0001
	(2) 65 - 69 (reference)	8951336	5680	**.**	.	8889985	5836	**.**	.
	(3) 70 - 74	9036801	5864	**1.0**	0.2293	9186490	6255	**1.0**	0.0447
	(4) 75 - 79	9087749	6511	**1.1**	<.0001	9465321	6841	**1.1**	<.0001
	(5) 80 - 84	9053957	6480	**1.1**	<.0001	9558321	7207	**1.1**	<.0001
	(6) 85+	11523754	8042	**1.1**	<.0001	11884356	8937	**1.1**	<.0001
Dual Eligible	No (reference)	42293324	27687	**.**	.	43185799	29287	**.**	.
	Yes	19036382	12952	**1.0**	0.0003	19539007	13595	**1.0**	0.0134
Gender	Female	33623012	22359	**1.0**	0.4291	34547949	23832	**1.0**	0.0385
	Male (reference)	27706694	18280	**.**	.	28176857	19050	**.**	.
Local Poverty	(Q1) 20%+	15244484	8851	**0.8**	<.0001	15798873	9195	**0.7**	<.0001
	(Q2) 13.4 - 19.9%	15212316	9545	**0.8**	<.0001	15538333	9693	**0.8**	<.0001
	(Q3) 8.0 - 13.3%	15036776	10165	**0.9**	<.0001	15384006	10881	**0.9**	<.0001
	(Q4) 0.0 - 7.9% (ref)	15798153	12055	**.**	.	15964519	13099	**.**	.
Race/Ethnicity	American Indian/Alaska	395112	262	**1.0**	0.8950	398652	238	**0.9**	0.0421
	Asian or Pacific Island	803766	637	**1.2**	<.0001	804387	636	**1.2**	0.0002
	Black	8657704	5888	**1.0**	0.0181	8822594	6133	**1.0**	0.1489
	Hispanic or Latino	1463279	884	**0.9**	0.0127	1494875	948	**0.9**	0.0292
	Other or Unknown Race/E	4262129	2800	**1.0**	0.9540	4310116	2935	**1.0**	0.9745
	White (reference)	49147305	32324	**.**	.	50381911	34329	**.**	.
Urban/Rural	Non-urban Area	6672059	3472	**0.7**	<.0001	6841305	3494	**0.7**	<.0001
	Urban Cluster	10938714	5884	**0.8**	<.0001	11232860	5912	**0.7**	<.0001
	Urbanized Area (ref)	43718694	31282	**.**	.	44650538	33475	**.**	.

Table 6: Adjusted CDI Rates

		Year			
		2012		2011	
Factor	Level	US RR	US p value	US RR	US p value
Age	(1) <65 Yrs	**0.9**	<.0001	**0.8**	<.0001
	(2) 65 - 69 (reference)	**.**	.	**.**	.
	(3) 70 - 74	**1.0**	0.1476	**1.0**	0.0333
	(4) 75 - 79	**1.1**	<.0001	**1.1**	<.0001
	(5) 80 - 84	**1.1**	<.0001	**1.1**	<.0001
	(6) 85+	**1.1**	<.0001	**1.1**	<.0001
Dual Eligible	No (reference)	**.**	.	**.**	.
	Yes	**1.1**	<.0001	**1.2**	<.0001
Gender	Female	**1.0**	0.1084	**1.0**	0.1740
	Male (reference)	**.**	.	**.**	.
Local Poverty	(Q1) 20%+	**0.8**	<.0001	**0.7**	<.0001
	(Q2) 13.4 - 19.9%	**0.9**	<.0001	**0.8**	<.0001
	(Q3) 8.0 - 13.3%	**0.9**	<.0001	**0.9**	<.0001
	(Q4) 0.0 - 7.9% (ref)	**.**	.	**.**	.
Race/Ethnicity	American Indian/Alaska	**1.2**	0.0062	**1.1**	0.2905
	Asian or Pacific Island	**1.1**	0.1634	**1.0**	0.8673
	Black	**1.1**	<.0001	**1.1**	<.0001
	Hispanic or Latino	**0.9**	0.0014	**0.9**	0.0038
	Other or Unknown Race/E	**1.1**	0.0150	**1.0**	0.3706
	White (reference)	**.**	.	**.**	.
Urban/Rural	Non-urban Area	**0.7**	<.0001	**0.7**	<.0001
	Urban Cluster	**0.8**	<.0001	**0.7**	<.0001
	Urbanized Area (ref)	**.**	.	**.**	.

Table 7: CLABSI, CAUTI, and CDI Rates by State

State	CLABSI Rate		CAUTI Rate		CDI Rate	
	2011	2012	2011	2012	2011	2012
AK	1.06	1.38	1.18	0.75	2.48	3.63
AL	1.12	0.96	0.71	0.60	3.14	3.22
AR	1.53	1.19	0.67	0.50	4.09	3.60
AZ	1.89	1.44	1.07	1.05	6.92	7.44
CA	2.00	1.62	0.78	0.67	6.89	6.94
CO	1.73	1.07	1.73	2.24	5.49	6.86
CT	1.65	1.21	0.94	0.99	9.73	8.53
DC	3.05	2.03	0.47	0.48	9.06	6.61
DE	1.69	0.87	0.47	0.59	7.83	6.58
FL	2.05	1.69	0.68	0.74	6.82	6.53
GA	1.73	1.18	0.79	0.68	5.12	5.20
HI	1.01	0.78	1.39	0.78	2.71	3.01
IA	1.18	0.81	1.21	1.11	6.39	6.32
ID	1.88	1.39	1.16	1.28	4.49	3.61
IL	1.54	1.19	0.77	0.60	7.12	6.92
IN	1.56	1.20	0.58	0.63	6.78	6.64
KS	1.27	0.75	0.78	0.79	5.21	5.55
KY	1.62	1.33	0.47	0.44	5.29	5.24
LA	1.98	1.89	0.53	0.51	3.69	4.07
MA	1.40	1.16	0.77	0.63	6.90	6.79
MD	3.51	2.27	1.76	1.72	23.94	19.44
ME	1.11	0.79	1.50	1.71	4.69	4.05
MI	1.74	1.46	0.83	0.73	6.99	6.73
MN	1.52	1.20	1.33	1.43	7.52	6.75
MO	1.72	1.20	0.76	0.88	7.08	6.86
MS	1.67	1.02	0.80	0.51	2.83	2.77
MT	1.74	1.00	1.18	1.81	4.05	4.57
NC	1.54	1.28	0.86	0.99	4.96	5.64
ND	0.66	0.78	0.93	0.31	4.34	4.83
NE	1.25	0.95	0.65	0.82	5.31	4.38
NH	1.59	1.65	1.14	0.84	6.40	5.68
NJ	2.15	1.76	0.67	0.41	8.79	8.20
NM	1.04	1.34	0.47	0.53	5.91	6.27
NV	2.15	1.59	0.34	0.41	7.25	6.94
NY	1.72	1.26	0.58	0.54	9.26	8.56
OH	1.59	1.33	0.72	0.82	7.12	7.15
OK	1.36	0.88	0.76	0.72	5.34	5.85
OR	0.93	0.98	1.07	1.30	5.29	4.55
PA	1.47	1.01	0.70	0.54	6.08	6.18
PR	1.42	1.28	0.18	0.19	0.80	0.75
RI	1.97	1.46	1.22	0.73	14.41	13.43
SC	1.28	1.02	0.61	0.48	3.70	3.61
SD	1.16	1.02	0.46	0.97	6.71	6.25
TN	1.65	1.22	1.65	1.52	4.56	4.51
TX	1.93	1.48	0.52	0.49	5.31	5.34
UT	2.16	1.76	1.38	1.62	7.31	5.96
VA	1.73	1.15	1.02	0.72	6.64	7.32
VI	1.18	1.21	0.59	0.00	2.36	0.00
VT	0.50	0.25	1.49	1.41	7.88	6.23
WA	1.83	1.59	1.43	1.42	8.44	7.50
WI	1.33	1.29	1.24	0.95	6.06	5.98
WV	1.73	1.53	0.91	0.86	5.01	5.64
WY	1.25	0.23	0.50	0.47	3.87	4.11

Table 8: CLABSI Crude RR, Black versus White Beneficiaries

	Year			
	2011		2012	
State	CLABSI RR	P value	CLABSI RR	P value
AK	***	***	***	***
AL	1.4	0.0455	1.9	0.0008
AR	1.7	0.0211	3.1	<.0001
AZ	***	***	***	***
CA	1.6	<.0001	1.6	<.0001
CO	***	***	***	***
CT	1.9	0.0060	2.7	<.0001
DC	1.5	0.1587	3.0	0.0122
DE	1.9	0.0559	1.9	0.1673
FL	2.4	<.0001	1.9	<.0001
GA	2.1	<.0001	2.7	<.0001
HI	***	***	***	***
IA	***	***	***	***
ID	***	***	***	***
IL	1.7	<.0001	2.0	<.0001
IN	2.2	<.0001	2.0	0.0001
KS	***	***	***	***
KY	1.6	0.0380	1.4	0.1821
LA	1.7	0.0002	2.2	<.0001
MA	1.3	0.3475	2.7	<.0001
MD	2.5	<.0001	1.8	<.0001
ME	***	***	***	***
MI	2.0	<.0001	2.2	<.0001
MN	***	***	***	***
MO	2.2	<.0001	1.8	0.0016
MS	2.0	<.0001	1.5	0.0686
MT	***	***	***	***

	Year			
	2011		2012	
State	CLABSI RR	P value	CLABSI RR	P value
NC	1.9	<.0001	2.0	<.0001
ND	***	***	***	***
NE	***	***	***	***
NH	***	***	***	***
NJ	1.8	<.0001	2.5	<.0001
NM	***	***	***	***
NV	2.6	0.0003	***	***
NY	1.8	<.0001	1.9	<.0001
OH	2.5	<.0001	2.0	<.0001
OK	1.3	0.3745	2.7	0.0034
OR	***	***	***	***
PA	1.8	<.0001	2.0	<.0001
PR	***	***	***	***
RI	***	***	***	***
SC	1.9	0.0003	3.0	<.0001
SD	***	***	***	***
TN	2.2	<.0001	2.5	<.0001
TX	1.6	<.0001	2.0	<.0001
UT	***	***	***	***
VA	2.0	<.0001	1.9	<.0001
VI	***	***	***	***
VT	***	***	***	***
WA	***	***	***	***
WI	2.0	0.0132	1.1	0.8815
WV	***	***	***	***
WY	***	***	***	***

Appendix: Mapping ADEs to ICD-9 Codes

HAI	ICD-9 Codes
CLABSI	996.62 999.31 9993.2
CAUTI	996.64
CDI	008.45